Problem statement The function S (the "squaring function") has domain all real numbers and is defined by the formula $S(x) = x^2$ for all x.

a) Consider the function T whose domain is also all real numbers which is defined by

$$T(x) = \begin{cases} S(x) & \text{if } x \neq 3 \\ 7 & \text{if } x = 3 \end{cases}.$$

Sketch a graph of T. What is $\lim_{x \to 5} T(x)$? What is $\lim_{x \to 3} T(x)$? Support your assertions.

b) An evil interstellar visitor *changes* exactly *one million values* of S and creates a new function, V. What can be said about $\lim_{x \to a} V(x)$ for all values of a? Support your assertions.